

54ACT823

9-Bit D Flip-Flop

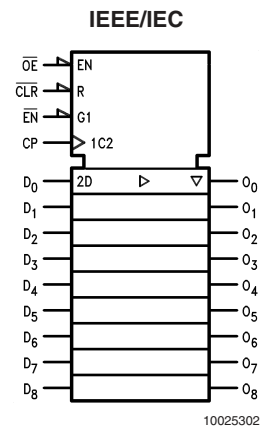
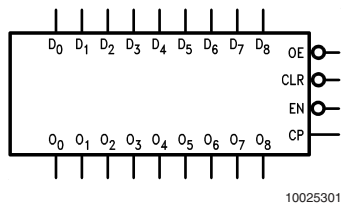
General Description

The ACT823 is a 9-bit buffered register. It features Clock Enable and Clear which are ideal for parity bus interfacing in high performance microprogramming systems. The ACT823 offers noninverting outputs and is fully compatible with AMD's Am29823.

Features

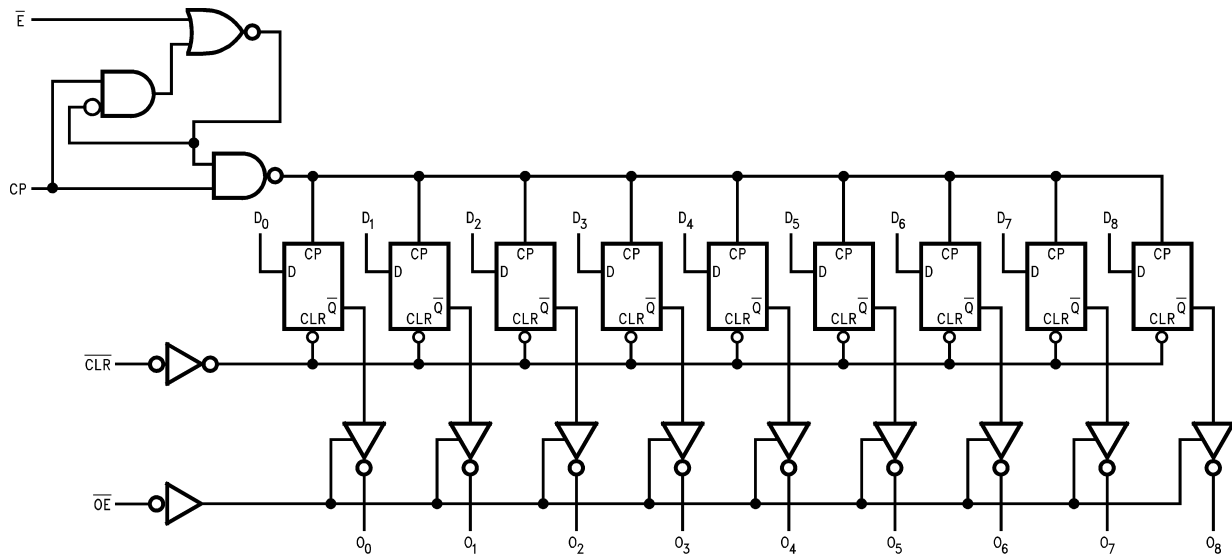
- Outputs source/sink 24 mA
- TRI-STATE outputs for bus interfacing
- Inputs and outputs are on opposite sides
- ACT823 has TTL-compatible inputs
- Standard Microcircuit Drawing (SMD) 5962-9161001

Logic Symbols



Pin Names	Description
D ₀ -D ₈	Data Inputs
O ₀ -O ₈	Data Outputs
\overline{OE}	Output Enable
\overline{CLR}	Clear
CP	Clock Input
\overline{EN}	Clock Enable

Logic Diagram



10025305

Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

Absolute Maximum Ratings (Note 1)

CDIP

175°C

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage (V_{CC})	-0.5V to 7.0V
DC Input Diode Current (I_{IK})	
$V_I = -0.5V$	-20 mA
$V_I = V_{CC} + 0.5V$	+20 mA
DC Input Voltage (V_I)	-0.5V to $V_{CC} + 0.5V$
DC Output Diode Current (I_{OK})	
$V_O = -0.5V$	-20 mA
$V_O = V_{CC} + 0.5V$	+20 mA
DC Output Voltage (V_O)	-0.5V to $V_{CC} + 0.5V$
DC Output Source or Sink Current (I_O)	±50 mA
DC V_{CC} or Ground Current per Output Pin (I_{CC} or I_{GND})	±50 mA
Storage Temperature (T_{STG})	-65°C to +150°C
Junction Temperature (T_J)	

Recommended Operating Conditions

Supply Voltage (V_{CC})	ACT	4.5V to 5.5V
Input Voltage (V_I)		0V to V_{CC}
Output Voltage (V_O)		0V to V_{CC}
Operating Temperature (T_A)	54ACT	-55°C to +125°C
Minimum Input Edge Rate ($\Delta V/\Delta t$)	ACT Devices	
	V_{IN} from 0.8V to 2.0V	
	V_{CC} @ 4.5V, 5.5V	125 mV/ns

Note 1: Absolute maximum ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. National does not recommend operation of FACT™ circuits outside databook specifications.

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	$T_A =$ -55°C to +125°C	Units	Conditions
V_{IH}	Minimum High Level Input Voltage	4.5	2.0	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		5.5	2.0		
V_{IL}	Maximum Low Level Input Voltage	4.5	0.8	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		4.5	0.8		
V_{OH}	Minimum High Level Output Voltage	4.5	3.7	V	$I_{OH} = -24$ mA
V_{OL}	Maximum Low Level Output Voltage	4.5	0.5	V	$I_{OL} = 24$ mA
I_{IN}	Maximum Input Leakage Current	5.5	±1.0	µA	$V_I = V_{CC}, GND$
I_{OZ}	Maximum TRI-STATE Current	5.5	±10.0	µA	$V_I = V_{IL}, V_{IH}$ $V_O = V_{CC}, GND$
I_{CCT}	Maximum I_{CC} /Input	5.5	1.6	mA	$V_I = V_{CC} - 2.1V$
I_{OLD}	(Note 3) Minimum Dynamic Output Current	5.5	50	mA	$V_{OLD} = 1.65V$ Max
I_{OHD}	Overdrive Current	5.5	-50	mA	$V_{OHD} = 3.85V$ Min
I_{CC}	Maximum Quiescent Supply Current	5.5	160	µA	$V_{IN} = V_{CC}$ or GND

Note 2: All outputs loaded; thresholds on input associated with output under test.

Note 3: Maximum test duration 2.0 ms, one output loaded at a time.

AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V) (Note 4)	$T_A = -55^\circ\text{C to } +125^\circ\text{C}$ $C_L = 50$ pF		Units	Fig. No.
			Min	Max		
f_{max}	Maximum Clock Frequency	5.0	95		MHz	

AC Electrical Characteristics (Continued)

Symbol	Parameter	V _{CC} (V) (Note 4)	T _A = -55°C to +125°C C _L = 50 pF		Units	Fig. No.
			Min	Max		
t _{PLH}	Propagation Delay CP to O _n	5.0	1.0	12.0	ns	
t _{PHL}	Propagation Delay CP to O _n	5.0	1.0	12.0	ns	
t _{PHL}	Propagation Delay $\overline{\text{CLR}}$ to O _n	5.0	1.0	18.0	ns	
t _{PZH}	Output Enable Time $\overline{\text{OE}}$ to O _n	5.0	1.0	11.5	ns	
t _{PZL}	Output Enable Time $\overline{\text{OE}}$ to O _n	5.0	1.0	12.0	ns	
t _{PHZ}	Output Disable Time $\overline{\text{OE}}$ to O _n	5.0	1.0	13.5	ns	
t _{PLZ}	Output Disable Time $\overline{\text{OE}}$ to O _n	5.0	1.0	12.0	ns	

Note 4: Voltage Range 5.0 is 5.0V ±0.5V

AC Operating Requirements

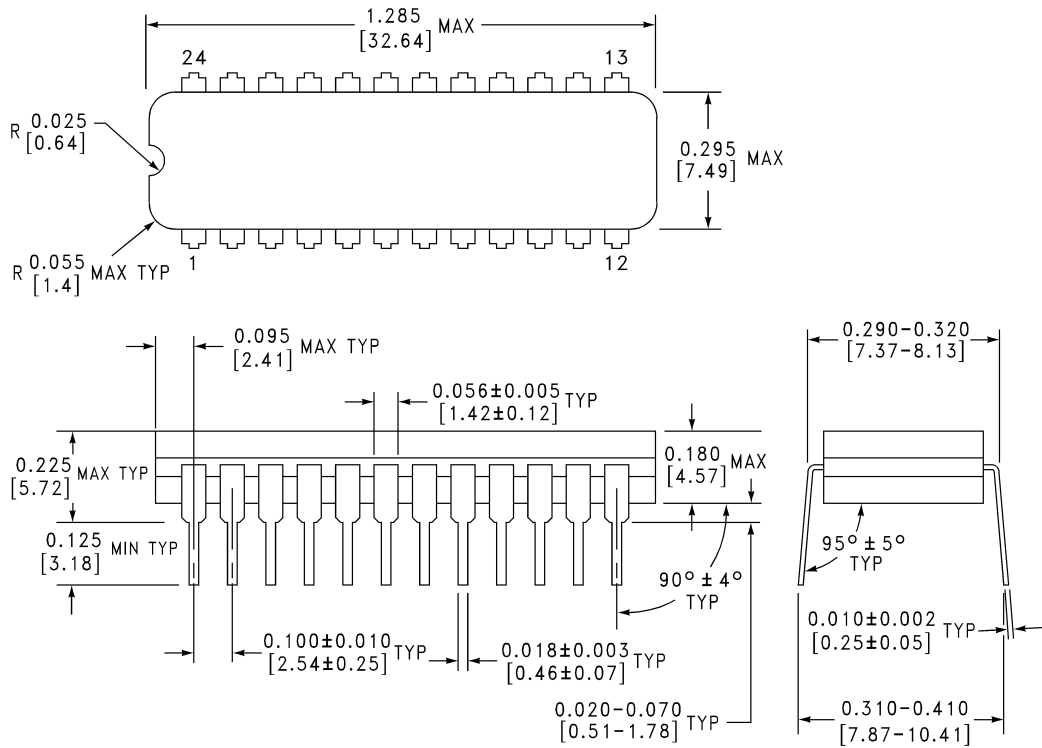
Symbol	Parameter	V _{CC} (V) (Note 5)	T _A = -55°C to +125°C C _L = 50 pF	Units	Fig.
			Guaranteed Minimum		
t _s	Setup Time, HIGH or LOW D to CP	5.0	4.0	ns	
t _h	Hold Time, HIGH or LOW D _n to CP	5.0	3.0	ns	
t _s	Setup Time, HIGH or LOW $\overline{\text{EN}}$ to CP	5.0	4.0	ns	
t _h	Hold Time, HIGH or LOW $\overline{\text{EN}}$ to CP	5.0	3.0	ns	
t _w	CP Pulse Width HIGH or LOW	5.0	6.0	ns	
t _w	$\overline{\text{CLR}}$ Pulse Width, LOW	5.0	7.5	ns	
t _{rec}	$\overline{\text{CLR}}$ to CP Recovery Time	5.0	4.5	ns	

Note 5: Voltage Range 5.0 is 5.0V ±0.5V

Capacitance

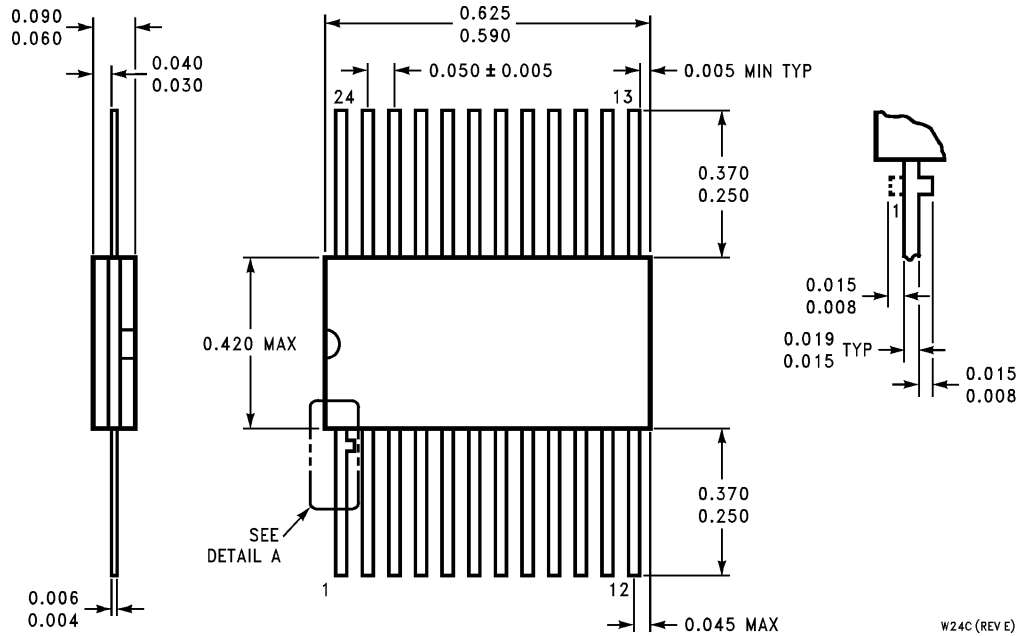
Symbol	Parameter	Max	Units	Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = OPEN
C _{PD}	Power Dissipation Capacitance	4.4	pF	V _{CC} = 5.0V

Physical Dimensions inches (millimeters) unless otherwise noted



J24F (REV. H)

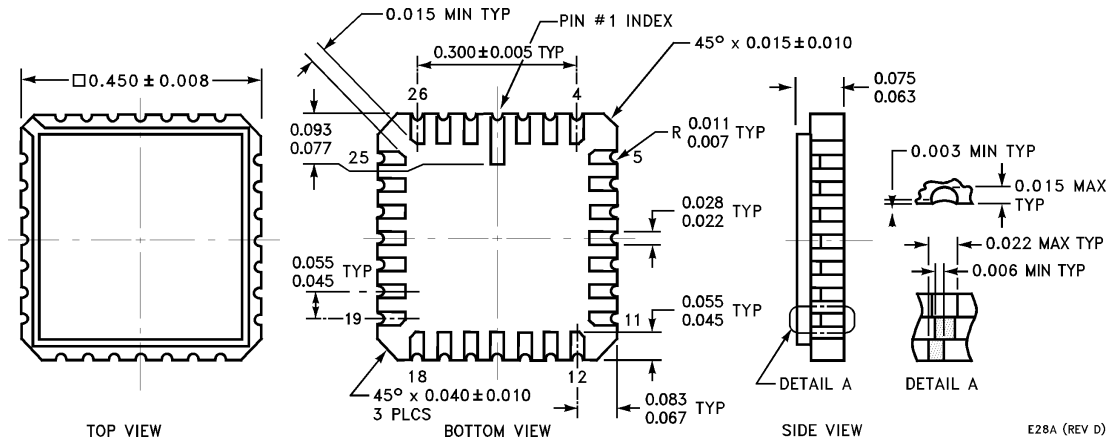
**24 Lead Ceramic Dual-in-line
Package Number J24F**



W24C (REV E)

**24 Lead Cerpack
Package Number W24C**

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



**28 Lead Ceramic Leadless Chip Carrier
Package Number E28A**

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT AND GENERAL COUNSEL OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



National Semiconductor
Americas Customer
Support Center
Email: new.feedback@nsc.com
Tel: 1-800-272-9959

National Semiconductor
Europe Customer Support Center
Fax: +49 (0) 180-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 69 9508 6208
English Tel: +44 (0) 870 24 0 2171
Français Tel: +33 (0) 1 41 91 8790

National Semiconductor
Asia Pacific Customer
Support Center
Email: ap.support@nsc.com

National Semiconductor
Japan Customer Support Center
Fax: 81-3-5639-7507
Email: jpn.feedback@nsc.com
Tel: 81-3-5639-7560

www.national.com